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EXAMINER	
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3744	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/597,906	BOER ET AL.	
	Examiner	Art Unit	
	PAOLO GONZALEZ	3744	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 September 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-41* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-41* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 September 2009* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the amendment filed on 09/29/2009. Currently claims 19-20 have been canceled and claims 21-41 are pending.

Drawings

2. The drawings were received on 09/29/2009. These drawings are acceptable and these drawings are further objected.

3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims.

- Therefore, the "cooling chamber" and "cooling compartment" (as per claims 21-23 and 41) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.
- The drawings are further objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "4" has been used to designate both the appliance control algorithm (ACA) (as shown in Replacement Sheet, figures 2A and 2B) and the probe temperature controller (PTC) (as shown in amended disclosure, page 4, paragraph [0021]) .

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the

drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities:

5. The amendment filed 09/29/2009 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: a refrigerator 1, or more generally referred to as a "cooling chamber" on page 3, paragraph [0017]. In accordance to the originally filed disclosure by applicant, "the cooling chamber" was defined as a cooling chamber for a food item placed therein (as per claim 19, line 2), in other words, it was inherently understood by original disclosure that the cooling chamber was either a freezing or a refrigeration compartment of a refrigerator/freezer. Applicant's amendment changes the definition of "cooling chamber" as being the entire refrigerator, which according to applicant's original disclosure the term "refrigerator" is being defined as any kind of domestic refrigerator and freezer (see page 1, paragraph [0002]) and not as a "cooling chamber" as amended.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Objections

6. Claims 21-41 are objected to because of the following informalities:

Claim 21 recites the term “the load” in line 2. There is insufficient antecedent basis for this limitation in the claim. Replace the word “the” with --a-- for clarity.

Claim 22 recites the term “the speed” in line 2. There is insufficient antecedent basis for this limitation in the claim. Replace the word “the” with --a-- for clarity.

Claim 23 recites the term “the operation” and “the temperature” in line 3. There is insufficient antecedent basis for this limitation in the claim. Replace the word “the” with --a-- for clarity.

Claim 28 recites the limitation "estimating the enthalpy of the food" in line 2. There is insufficient antecedent basis for this limitation in the claim. Replace the word “the” in front of the word “enthalpy” with --a-- for clarity.

Claim 29 recites the term “the speed” in line 2 and the term “temperation” in line 3. There is insufficient antecedent basis for these limitation in the claim. Replace the word “the” with --a—in line 2 for clarity. Moreover, replace the word “temperation” by --temperature-- in line 3 for clarity.

Claim 32 recites the term “sensing the temperature” in line 2. There is insufficient antecedent basis for this limitation in the claim. Replace the word “the” with --a-- for clarity.

The above is an indicative, but not necessarily an exhaustive, list of claim objections, problems. Applicant is therefore advised to carefully review all the claims for additional problems. Correction is required of all the claim objections problems, whether or not these were particularly pointed out above.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 21-41 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. In accordance to the originally filed disclosure by applicant, "the cooling chamber" was defined as a cooling chamber for a food item placed therein (as per claim 19, line 2), in other words, it was inherently understood by original disclosure that the cooling chamber was either a freezing or a refrigeration compartment of a refrigerator/freezer. Applicant's amendment changes the definition of "cooling chamber" as being the entire refrigerator, which according to applicant's original disclosure the term "refrigerator" is being defined as any kind of domestic refrigerator and freezer (see page 1, paragraph [0002]) and not as a "cooling chamber" as amended. This change affects the claims scope, thus new matter is being added. For purpose of this examination, examiner is interpreting the "cooling chamber" as being freezing or a refrigeration compartment of a refrigerator/freezer so as to be consistent of what was originally disclosed by applicant.

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 23-40 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 23 recites the limitation “the cooling chamber” in lines 4 and 9 and the limitation "cooling compartment" in lines 2, and 5. In regards to claim limitation of “the cooling chamber”, there is insufficient antecedent basis for this limitation in the claim. Moreover, it is unclear whether “the cooling chamber” and the “cooling compartment” are the same. For purpose of this examination, examiner is interpreting for these limitation to be the same, in other words, examiner is interpreting the "cooling chamber” as being freezing or a refrigeration compartment of a refrigerator/freezer so as to be consistent of what was originally disclosed by applicant. Claim 23 further recites the limitation "in response to an increased load" in line 6. It is unclear what it is meant by this limitation. Is the step of determining a variation in the temperature of the cooling compartment starts after detecting an "increased load" (meaning an addition of a warm food) inside the compartment? Is the “increased load referring to addition of a warm food inside the compartment? For purpose of this examination, examiner is interpreting this limitation to mean as follow: the step of determining a variation in the temperature of the cooling compartment is due to an increased load, in other words an addition of a warm food, inside the cooling compartment. Moreover, claim 23 recites the limitation “reduce the temperature in the cooling chamber below the set temperature an amount to compensate for the load of the at least one warm food item” in lines 10-11. It is unclear what it is meant by this limitation. Is the term "an amount" referring to the set temperature or to the reduction of temperature in the cooling chamber? Is the “an amount” to compensate for the load of the warm food item referring to a set

temperature amount? There is insufficient antecedent basis for this limitation "an amount" in the claim. In addition, the term "an amount" in the claim is a relative term which renders the claim indefinite. The term "an amount" is not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. Assuming that the amount is referring to the set temperature, this amount could be different to two different people. For purpose of this examination, the examiner is interpreting this limitation to refer to the set temperature, in other words, in the step of increasing the cooling capacity of the compressor in response to the determined variation in the temperature to reduce the temperature in the cooling chamber below a set temperature, which is a set reference value/amount used to indicate that the temperature in the cooling compartment has been compensated for the load of the at least one warm food item.

Claim 24 recites the limitation "the adjusting of the cooling capacity" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim. It is unclear whether this limitation is referring back to the limitation "increasing the cooling capacity" as claimed in claim 23, line 8. For purpose of this examination, examiner is interpreting this limitation to be referring back to the limitation "increasing the cooling capacity" as claimed in claim 23, line 8.

Claim 26 recites the limitation "the increased enthalpy" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim. It is unclear to what this limitation is referring to. Is "the increased enthalpy" referring to "the increased load" of claim 23? For purpose of this examination, the examiner is interpreting this limitation being the same as "the increased load" as claimed in claim 23. Therefore, "the increased enthalpy" is basically an increased load, in other words, an addition of a warm food, inside the compartment.

Claims 25 and 27-40 are rejected for incorporating the above deficiency from their respective parent claim by dependency.

The above is an indicative, but not necessarily an exhaustive, list of 35 U.S.C. 112, second paragraph, problems. Applicant is therefore advised to carefully review all the claims for additional problems. Correction is required of all the 35 U.S.C. 112, second paragraph problems, whether or not these were particularly pointed out above.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 22-25 and 41, as best understood, are rejected under 35 U.S.C. 102(b) as being anticipated by Kobayashi et al. (U.S. Pat. 4,718,847).

Regarding claim 23, Kobayashi et al. teach in figures 1, 2A-B, and 3 discloses a method for controlling a cooling capacity of a compressor (10) in a refrigerator having a cooling compartment (freezer and fresh food compartment) (see abstract; column 1, lines 62-67; column 2, lines 27-31; it is recited a freezer and fresh food compartment; column 2, line 56 to column 3, line 13; column 3, lines 16-42) comprising: controlling the operation of the compressor to maintain the temperature (T_R, T_F) within the cooling chamber (being interpreted as the cooling compartment; see column 2, lines 27-31; it is recited a freezer and fresh food compartment) at a set temperature (T_{R°, T_{F°) (see figure 3; column 2, line 56 to column 3, line 13; column 3, lines 16-42); determining a variation in the temperature of the cooling compartment (freezer and fresh

food compartment) in response to an increased load due to the addition of at least one warm food item in the cooling compartment (freezer and fresh food compartment) (see figures 2A-B and 3, where it is shown a temperature variation between a set temperature and a sense temperature of the freezer and fresh food compartments of a refrigerator; column 3, lines 16-23); and increasing the cooling capacity of the compressor (10) in response to the determined variation in the temperature to reduce the temperature (T_R, T_F) in the cooling chamber (freezer and fresh food compartment) below the set temperature ($T_{R°}$, $T_{F°}$), an amount to compensate for the load of the at least one warm food item (this limitation being interpreted as "a set temperature, which is a set reference value/amount used to indicate that the temperature in the cooling compartment has been compensated for the load of the at least one warm food item") (see column 3, lines 16-43; column 3, line 63 to column 4, line 2).

Regarding claim 24, Kobayashi et al. disclose the invention as recited above and Kobayashi et al. further teach wherein the adjusting (being interpret as "the increased in cooling capacity" as claimed in claim 23) of the cooling capacity is in proportion to the determined temperature variation (see column 3, lines 16-43; column 3, line 63 to column 4, line 2; it is being taught that the system will increase the cooling capacity of the compressor (1) until the sensed temperature (T_R, T_F) is below a set temperature ($T_{R°}$, $T_{F°}$) (said temperature comparison being the determined temperature variation). The cooling capacity operation of the compressor is proportional to the determined temperature variation since the compressor won't change cooling capacity operation until the sensed temperature (T_R, T_F) is below a set temperature ($T_{R°}$, $T_{F°}$), thus it is implicitly understood by Kobayashi et al. the proportional relation between the increased in cooling capacity of the compressor and the determined temperature variation).

Regarding claim 25, Kobayashi et al. disclose the invention as recited above and Kobayashi et al. further teach wherein the determined temperature variation comprises comparing a sensed temperature (T_R, T_F) of the cooling compartment to a reference temperature (T_{R°, T_{F°) (see figures 2A-B and 3, where it is shown a temperature variation between a set temperature and a sense temperature of the freezer and fresh food compartments of a refrigerator; column 3, lines 16-23).

Regarding claim 41, Kobayashi et al. teach in figures 1, 2A-B, and 3 discloses a refrigerator (10) comprising: a cooling chamber capable of cooling a food item placed therein; a compressor (10) having an adjustable cooling capacity (see abstract; column 1, lines 65-67; column 2, lines 3-13; column 3, lines 16-43; column 3, line 63 to column 4, line 2); a temperature sensor (1, 2) providing a signal representative of the temperature (T_R, T_F) of the cooling chamber (see figures 2A-B; column 2, lines 3-13 and lines 27-33) ; and a controller (3) operably coupled to the compressor (10) and temperature sensor (1, 2) (see column 2, lines 31-33; lines 50-53. It is recited a microcomputer 3 applying outputs to triacs 5, 6, inverter circuit 8 and relay 9 in accordance with the inputs from the temperature sensors (1, 2). As seen in column 2, lines 35-37, traic 6 is for driving the compressor 10 with a frequency from a commercial power supply 1. Also, inverter circuit 8 is also used to drive the compressor 10 at a higher speed, please see column 2, lines 39-49. thus, it is anticipated that controller (3) is operably coupled to the compressor (10) and temperature sensor (1, 2)) capable of receiving the signal (T_R, T_F) over time from the temperature sensor (1, 2) (see figures 2A-B) such that the controller is capable of controlling the operation of the compressor (see column 2, lines 31-33; lines 39-49; and lines 50-53) capable of maintaining the temperature (T_R, T_F) within the cooling chamber at a set

temperature (T_{R°, T_{F°) (see figures 2A-B, section 1; column 2, lines 56-68; column 3, lines 16-43) and capable of determining an increase in the temperature (T_R, T_F) of the cooling chamber indicative of the addition of a warm food item into the cooling chamber (see column 3, lines 16-23), where the controller (3) increases the cooling capacity of the compressor (10) to reduce the temperature (T_R, T_F) in the cooling chamber below the set temperature (T_R, T_F), an amount to compensate for the load of the at least one warm food item (this limitation being interpreted as "a set temperature, which is a set reference value/amount used to indicate that the temperature in the cooling compartment has been compensated for the load of the at least one warm food item") (see column 3, lines 16-43; column 3, line 63 to column 4, line 2). It is noted by the examiner that the phase "for cooling a food item placed therein" is a statement of intended use and the device is capable of performing the function as recited above.

Regarding claim 22, Kobayashi et al. disclose the invention as recited above and Kobayashi et al. further teach wherein the controller (3) adjusts the cooling capacity by adjusting at least one of the speed of the compressor (10) (see column 2, lines 56-60; column 3, line 63 to column 4, line 2).

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

14. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

15. Claims 21-38, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 05-272854 A (English translation) in view of Kobayashi et al. (U.S. Pat. 4,718,847).

Regarding claim 23, figure 1-9 of English translation discloses a method for controlling a cooling capacity of a compressor (55) in a refrigerator (1) having a cooling compartment (46), comprising: controlling the operation of the compressor (55) capable of maintaining the temperature within the cooling chamber (being interpret as the cooling compartment) (46) at a set temperature (see paragraphs [0021]-[0022], where it is recited a micro-processor (60) that determines the time to continuously operate the compressor motor (55) and a control part (63) to control the operation of the compressor motor (55); paragraph [0035]-[0036] and [0049]; where it is recited that as a result of a rapid-chilling signal, the compressor motor (55) will operate. Also, it is recited a rapid-freezing control means (61) will determined the time to continuously operate the compressor. It is inherently understood that the control of the operation of the compressor motor is to maintain a temperature within the cooling compartment at a set temperature inputted by a user); determining a variation in the temperature of the cooling compartment (46) in response to an increased load due to the addition of at least one warm food item in the cooling compartment (46) (see paragraphs [0021] to [0023], where it is recited a step

of determining a variation in the temperature of the cooling compartment between a temperature detected by a rapid-chilling compartment temperature sensor 53 and a load temperature sensor 54. It is also recited the system having a rapid-freezing control means 61 comprising a determination part 62 that will not only output an introduction signal after determining whether or not a load has been introduced based on the variation in the temperature of the cooling compartment and controlling the operation of the compressor motor 55. Also see paragraphs [0029] to [0033]; where it is recited a step of determining a variation in the temperature of the cooling compartment between different temperature variable in order to determine the measurement of the size of the load inside the cooling compartment); and English translation teaches a step of controlling the compressor motor compressor in response to the determined variation in the temperature (see paragraphs [0020]; [0022], [0027] to [0028]; [0035] to [0036]; and [0049]).

However, English translation is silent on explicitly recite increasing the cooling capacity of the compressor in response to the determined variation in the temperature to reduce the temperature in the cooling chamber below the set temperature an amount to compensate for the load of at least one warm food item.

Kobayashi et al. teach in figures 1, 2A-B, and 3 discloses a method for controlling a cooling capacity of a compressor (10) in a refrigerator having a cooling compartment (freezer and fresh food compartment) (see abstract; column 1, lines 62-67; column 2, lines 27-31; it is recited a freezer and fresh food compartment; column 2, line 56 to column 3, line 13; column 3, lines 16-42) comprising: the step of increasing the cooling capacity of the compressor (10) in response to the determined variation in the temperature (see figures 2A-B and 3, where it is

shown a temperature variation between a set temperature and a sense temperature of the freezer and fresh food compartments of a refrigerator; column 3, lines 16-23) to reduce the temperature (T_R, T_F) in the cooling chamber below the set temperature ($T_{R°}$, $T_{F°}$), an amount to compensate for the load of the at least one warm food item (this limitation being interpreted as "a set temperature, which is a set reference value/amount used to indicate that the temperature in the cooling compartment has been compensated for the load of the at least one warm food item") (see column 3, lines 16-43; column 3, line 63 to column 4, line 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the method of English translation to incorporate the step of increasing the cooling capacity of the compressor in response to the determined variation in the temperature to reduce the temperature in the cooling chamber below the set temperature an amount to compensate for the load of at least one warm food item in view of Kobayashi et al. so as to decrease power consumption and noise within the system since the compressor won't have to operate continuously or at high speed when increase in load inside a cooling compartment due to loading food item into the cooling compartment.

Regarding claim 24, English translation as modified disclose the invention as recited above and Kobayashi et al. further teach wherein the adjusting (being interpret as "the increased in cooling capacity" as claimed in claim 23) of the cooling capacity is in proportion to the determined temperature variation (see column 3, lines 16-43; column 3, line 63 to column 4, line 2; it is being taught that the system will increase the cooling capacity of the compressor (1) until the sensed temperature (T_R, T_F) is below a set temperature ($T_{R°}$, $T_{F°}$) (said temperature comparison being the determined temperature variation). The cooling capacity operation of the

compressor is proportional to the determined temperature variation since the compressor won't change cooling capacity operation until the sensed temperature (T_R, T_F) is below a set temperature (T_{R°, T_{F°), thus it is implicitly understood by Kobayashi et al. the proportional relation between the increased in cooling capacity of the compressor and the determined temperature variation).

Regarding claim 25, English translation as modified disclose the invention as recited above and English translation further teach wherein the determined temperature variation comprises comparing a sensed temperature of the cooling compartment to a reference temperature (being the temperature from the load temperature sensor 54) (see figures 1-9; paragraph [0021] to paragraph [0025]; and paragraph [0035] to [0036]; paragraph [0045] to [0046]). Furthermore, Kobayashi et al. further teach wherein a determined temperature variation comprises comparing a sensed temperature (T_R, T_F) of the cooling compartment to a reference temperature (T_{R°, T_{F°) (see figures 2A-B and 3, where it is shown a temperature variation between a set temperature and a sense temperature of the freezer and fresh food compartments of a refrigerator; column 3, lines 16-23).

Regarding claim 26, English translation as modified disclose the invention as recited above and English translation further teach wherein the increased enthalpy (this limitation is being interpret as follow: "the increased enthalpy" is basically an increased load, in other words, an addition of a warm food, inside the compartment) is attributable to the placement of a food item inside the refrigerator (see abstract; see figures 5-9; see abstract; paragraph [0001]; paragraph [0006]; paragraph [0022]; paragraph [0029] to [0033]; paragraph [0046] and paragraph [0049]).

Regarding claim 27, English translation as modified disclose the invention as recited above and English translation further teach wherein the adjusting the cooling capacity comprises analyzing a shape factor of the determined temperature variation, wherein such shape factor is selected from the group consisting of derivatives, area, peak, overshoot duration, and power spectrum (see figures 7-8; see paragraphs [0034] to [0044]).

Regarding claim 28, English translation as modified disclose the invention as recited above and English translation further teach wherein the adjusting of the cooling capacity further comprises estimating the enthalpy of the food from an analysis of at least one of the shape factors (see figures 7-8; see paragraphs [0034] to [0044]).

Regarding claim 29, English translation as modified disclose the invention as recited above and Kobayashi et al. further teach wherein the controller (3) adjusts the cooling capacity by adjusting at least one of the speed of the compressor (10) (see column 2, lines 56-60; column 3, line 63 to column 4, line 2). Furthermore, English translation further teach wherein at least one of the integral and the peak of the determined temperature variation is below a reference temperature (see figures 7-8; see paragraph [0034] to [0044]).

Regarding claim 30, English translation as modified disclose the invention as recited above and English translation further teach wherein the reference temperature is an average temperature (see paragraph [0038] to [0043]).

Regarding claim 31, English translation as modified disclose the invention as recited above and Kobayashi et al. further teach wherein the adjusting (being interpret as "the increased in cooling capacity" as claimed in claim 23) of the cooling capacity is in proportion to the determined temperature variation (the estimated enthalpy) (see column 3, lines 16-43; column 3,

line 63 to column 4, line 2; it is being taught that the system will increase the cooling capacity of the compressor (1) until the sensed temperature (T_R, T_F) is below a set temperature (T_{R°, T_{F°) (said temperature comparison being the determined temperature variation). The cooling capacity operation of the compressor is proportional to the determined temperature variation since the compressor won't change cooling capacity operation until the sensed temperature (T_R, T_F) is below a set temperature (T_{R°, T_{F°), thus it is implicitly understood by Kobayashi et al. the proportional relation between the increased in cooling capacity of the compressor and the determined temperature variation). Furthermore, English translation further teach wherein the adjusting of the cooling capacity is proportional to the estimated enthalpy (see figures 1-9; see abstract; paragraph [0001]; paragraph [0022]; paragraph [0029] to [0033]; paragraph [0046] and paragraph [0049]).

Regarding claim 32, English translation as modified disclose the invention as recited above and English translation further teach wherein the determined temperature variation comprises comparing a sensed temperature of the cooling compartment (46) to a reference temperature (being the temperature from the load temperature sensor 54) (see figures 1-9; paragraph [0021] to paragraph [0025]; and paragraph [0035] to [0036]; paragraph [0045] to [0046]). Furthermore, Kobayashi et al. further teach wherein a determined temperature variation comprises comparing a sensed temperature (T_R, T_F) of the cooling compartment to a reference temperature (T_{R°, T_{F°) (see figures 2A-B and 3, where it is shown a temperature variation between a set temperature and a sense temperature of the freezer and fresh food compartments of a refrigerator; column 3, lines 16-23).

Regarding claim 33, English translation as modified disclose the invention as recited above and Kobayashi et al. further teach wherein a comparison determines when the sensed temperature (T_R, T_F) is above the reference value($T_{R°}$, $T_{F°}$) (see figures 2A-B and 3, where it is shown a the sensed temperature (T_R, T_F) being above the reference value($T_{R°}$, $T_{F°}$); and also see column 3, lines 16-23).

Regarding claim 34, English translation as modified disclose the invention as recited above and English translation further teach comprising estimating an enthalpy of a food item placed in the refrigerator from at least the overshoot shape of the sensed temperature (see figure 7-8; see paragraph [0034] to [0044]) , and increasing/adjusting the cooling capacity of the variable capacity compressor so that at least one of an integral and a peak of the temperature variation below the reference value is proportional to the estimated enthalpy (see figures 5-9; see paragraph [0029] to [0044]). Kobayashi et al. further teach wherein the adjusting (being interpret as "the increased in cooling capacity" as claimed in claim 23) of the cooling capacity is in proportion to the determined temperature variation (the estimated enthalpy) (see column 3, lines 16-43; column 3, line 63 to column 4, line 2; it is being taught that the system will increase the cooling capacity of the compressor (1) until the sensed temperature (T_R, T_F) is below a set temperature ($T_{R°}$, $T_{F°}$) (said temperature comparison being the determined temperature variation). The cooling capacity operation of the compressor is proportional to the determined temperature variation since the compressor won't change cooling capacity operation until the sensed temperature (T_R, T_F) is below a set temperature ($T_{R°}$, $T_{F°}$), thus it is implicitly understood by Kobayashi et al. the proportional relation between the increased in cooling capacity of the compressor and the determined temperature variation).

Regarding claim 35, English translation as modified disclose the invention as recited above and English translation further teach processing shape factors such as areas and derivatives of the temperature sensor output signals using soft computing techniques such as fuzzy logic and neural networks to provide an estimated enthalpy of a food item and to adapt the compressor response thereto (see figures 5-9; see paragraph [0029] to [0044]; table 1).

Regarding claim 41, English translation teach in figures 1-9 a refrigerator (1) comprising: a cooling chamber (46) capable of cooling a food item placed therein; and a compressor (55) having an adjustable cooling capacity (paragraph [0020]; paragraph [0022], paragraph [0027] to [0028]; paragraph [0035] to [0036]; and paragraph [0049]see paragraph [0020]. In addition for clarity, see paragraphs [0021]-[0022], where it is recited a micro-processor (61) that determines the time to continuously operate the compressor motor (55) and a control part (63) to control the operation of the compressor motor (55); paragraph [0035]-[0036] and [0049]; where it is recited that as a result of a rapid-chilling signal, the compressor motor (55) will operate. Also, it is recited a rapid-freezing control means (61) will determined the time to continuously operate the compressor. It is implicitly understood that the compressor is capable of operating continuously but the teaching is not limiting the operation of the compressor to only continuously, therefor, it is implicitly understood that the capacity of the compressor is adjustable); a temperature sensor (53 and 54) providing a signal representative of the temperature of the cooling chamber (46) (see paragraphs [0019], [0021]); and a controller (60) operably coupled to the compressor (55) and temperature sensor (53 and 54) (see paragraphs [0021]-[0022], where it is recited a micro-processor (61) that determines the time to continuously operate the compressor motor (55) based on both temperature detected by the temperature

sensors (53 and 54); and a control part (63) to control the operation of the compressor motor (55) based on temperature detected by both temperature sensors (53 and 54); and also see paragraphs [0036] and [0049]) capable of receiving the signal over time from the temperature sensor (53 and 54) such that the controller controls the operation of the compressor capable of maintaining the temperature within the cooling chamber at a set temperature (see paragraphs [0021]-[0022], where it is recited a micro-processor (61) that determines the time to continuously operate the compressor motor (55) and a control part (63) to control the operation of the compressor motor (55); paragraph [0035]-[0036] and [0049]; where it is recited that as a result of a rapid-chilling signal, the compressor motor (55) will operate. Also, it is recited a rapid-freezing control means (61) will determined the time to continuously operate the compressor. It is inherently understood that the control of the operation of the compressor motor is to maintain a temperature within the cooling compartment at a set temperature inputted by a user), and determines an increase in the temperature of the cooling chamber (46) indicative of the addition of a warm food item into the cooling chamber (see paragraphs [0021] to [0023], where it is recited a step of determining an increase in the temperature of the cooling chamber by detecting a temperature detected by a rapid-chilling compartment temperature sensor 53 and a load temperature sensor 54. It is also recited the system having a rapid-freezing control means 61 comprising a determination part 62 that will not only output an introduction signal after determining whether or not a load has been introduced based on the increase in the temperature of the cooling chamber and controlling the operation of the compressor motor 55. Also see paragraphs [0029] to [0033]; where it is recited a step of determining an increase in the temperature of the cooling compartment between different temperature variable in order to determine the measurement of the size of the load inside the

cooling compartment); and English translation teaches a step of controlling the compressor motor compressor in response to the determined variation in the temperature (see paragraphs [0020]; [0022], [0027] to [0028]; [0035] to [0036]; and [0049]).

However, English translation is silent on explicitly recite increasing the cooling capacity of the compressor in response to the determined variation in the temperature to reduce the temperature in the cooling chamber below the set temperature an amount to compensate for the load of at least one warm food item.

Kobayashi et al. teach in figures 1, 2A-B, and 3 discloses where a controller (3) increases the cooling capacity of the compressor (10) to reduce the temperature (T_R, T_F) in the cooling chamber (freezer and fresh food compartment) below the set temperature (T_R, T_F), an amount to compensate for the load of the at least one warm food item (this limitation being interpreted as "a set temperature, which is a set reference value/amount used to indicate that the temperature in the cooling compartment has been compensated for the load of the at least one warm food item") (see column 3, lines 16-43; column 3, line 63 to column 4, line 2).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the controller of English translation to incorporate the step of increasing the cooling capacity of the compressor in response to the determined variation in the temperature to reduce the temperature in the cooling chamber below the set temperature an amount to compensate for the load of at least one warm food item in view of Kobayashi et al. so as to decrease power consumption and noise within the system since the compressor won't have to operate continuously or at high speed when increase in load inside a cooling compartment due to loading food item into the cooling compartment.

Regarding claim 21, English translation as modified teaches the invention as recited above and English translation further wherein the controller (60) determines the load by estimating an enthalpy of the food items in the cooling chamber (46) (see figures 1-9; see abstract; paragraph [0001]; paragraph [0021] to [0022]; paragraph [0029] to [0033]; paragraph [0046] and paragraph [0049]).

Regarding claim 22, English translation as modified teaches the invention as recited above and English translation further discloses a refrigerator (1) according to claim 19, wherein the controller (60) adjusts the cooling capacity by adjusting at least one of the speed and run time of the compressor (see figures 1-9; paragraph [0020]; paragraph [0022], paragraph [0027] to [0028]; paragraph [0035] to [0036]; and paragraph [0049]).

16. Claims 36-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 05-272854 A (English translation) in view of Kobayashi et al. (U.S. Pat. 4,718,847), and further in view of Fung (US Pat. 5,586,444).

Regarding claim 36, English translation as modified teaches the invention as recited above and Kobayashi et al. further teach wherein the adjusting (being interpret as "the increased in cooling capacity" as claimed in claim 23) of the cooling capacity is in proportion to the determined temperature variation (the estimated enthalpy) (see column 3, lines 16-43; column 3, line 63 to column 4, line 2; it is being taught that the system will increase the cooling capacity of the compressor (1) until the sensed temperature (T_R, T_F) is below a set temperature ($T_{R°}$, $T_{F°}$) (said temperature comparison being the determined temperature variation). The cooling capacity operation of the compressor is proportional to the determined temperature variation since the compressor won't change cooling capacity operation until the sensed temperature (T_R, T_F) is

below a set temperature (T_{R°, T_{F°), thus it is implicitly understood by Kobayashi et al. the proportional relation between the increased in cooling capacity of the compressor and the determined temperature variation).

However, English translation as modified does not explicitly discloses the step of switching a compressor to one of on and off when a temperature inside the refrigerator reaches one of a nominal cut-on temperature and cut-off temperature, respectively, so that that such cut-on temperature and cut-off temperature are adjusted according to an estimated enthalpy and are progressively readjusted to the nominal values in order to provide an energy efficient cooling.

Nevertheless, Fung discloses the step of switching a compressor to one of on and off when a temperature inside the refrigerator reaches one of a nominal cut-on temperature and cut-off temperature, respectively, so that that such cut- on temperature and cut-off temperature are adjusted according to an estimated enthalpy and are progressively readjusted to the nominal values in order to provide an energy efficient cooling (see abstract; see figure 1-9; column 3, lines 1-46; column 4, line 48 to column 5, line 6; column 6, lines 6-14 and lines 19-36; column 7, line 43 to column 8, line 19).

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to modify the method disclosed by English translation as modified to incorporate the step of switching a compressor to one of on and off when a temperature inside the refrigerator reaches one of a nominal cut-on temperature and cut-off temperature, respectively, so that that such cut- on temperature and cut-off temperature are adjusted according to an estimated enthalpy and are progressively readjusted to the nominal values in order to provide an energy efficient cooling as taught by Fung as both English translation as modified and Fung are directed to the

method of controlling/adjusting the cooling capacity of a compressor accordingly to an estimated enthalpy of a food item inside a refrigeration system, since it is well know in the art at the time of the invention that the design/construction of controllers are alter in order to met specific design criteria and so as to decrease power consumption and noise within the system since the compressor won't have to operate continuously or at high speed when increase in load inside a cooling compartment due to loading food item into the cooling compartment.

Regarding claim 37 and 38, English translation as modified teaches the invention as recited above but English translation as modified fails explicitly disclose further comprising the step of determining an integral of the temperature variation above the reference value and increasing the cooling capacity of the variable capacity compressor so that at least one of the integral and a peak value of the temperature variation is proportional to integral nor the step of determining a derivative of a decrease in the sensed temperature below the reference value and increasing the cooling capacity of the variable capacity compressor so that at least one of the derivative and the peak of the temperature variation is inversely proportional to the estimated derivative.

Fung discloses a the use of a "PID" proportional-integral-differential (PID) controller to adjust the cooling capacity of the refrigeration system based on enthalpy of food being placed inside the system comprising the steps not taught by English translation (see abstract, see figure 1-9; column 6, lines 6-14 and lines 19-36; column 7, line 43 to column 10, line 37; claims 1-9).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the controller disclosed by English translation with the controller taught by Fung as both English translation and Fung are directed to the method of controlling/adjusting the

cooling capacity of a compressor accordingly to an estimated enthalpy of a food item inside a refrigeration system, since it is well know in the art at the time of the invention that the design/construction of controllers are alter in order to met specific design criteria and so as to decrease power consumption and noise within the system since the compressor won't have to operate continuously or at high speed when increase in load inside a cooling compartment due to loading food item into the cooling compartment.

Regarding claim 39, English translation as modified teaches the invention as recited above and Fung further teach comprising the step of adjusting the cooling capacity of the compressor (30, 32, 34, and 36) pursuant to the application of a control algorithm based on a proportional-derivative-integral technique (142) according to the formula

$$u(t) = Kp * [e(t) + \frac{1}{Ti} * \int_0^t e(t)\,dt + Td * \frac{de(t)}{dt}]$$

Wherein

u(t) = compressor cooling capacity request (NEWSPEED);

Kp = preselected coefficient (KP),

e(t) = temperature error = Tprobe-Ttarget, (DDELTA = (PDELTA – PDELTA)/sample time = rate of change of the error signal between the suction pressure and the target pressure)

Ti = integral time (Ki),

Td = derivative time (SAMPLE_TIME),

T_{target} = temperature reference depending on user set temperature.

(see abstract, see figure 1-9; column 6, lines 6-14 and lines 19-36; column 7, line 43 to column 10, line 37; Fung uses the pressure parameter in the PID, yet it is implicitly understood in column 4, line 48 to column 5, line 6 that the parameter may be the temperature inside the refrigeration system, thus it is implicitly understood that instead of the pressure, the temperature is incorporated into the PID technique in order to adjust the cooling capacity of the compressor based on the temperature parameter).

Regarding claim 40, English translation as modified teaches the invention as recited above and Fung further teach comprising the step of adjusting the parameters Ti, Td, and Kp according to one of opening the refrigerator door and detecting a sudden rise in temperature in order to speed up a cooling time (see abstract; see figure 1-9; column 1, line 48 to column 2, line 29; column 4, line 48 to column 5, line 6; column 6, lines 6-14 and lines 19-36; column 8, line 12 to column 10, line 37; Fung discloses that is well know in the art that adjusting parameters to speed up a cooling time when refrigeration load is influenced when the refrigerator system doors are open or when placing items inside the refrigerator system, as disclosed in column 1, lines 23-35).

Response to Arguments

17. Applicant's arguments with respect to claims 21-41 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAOLO GONZALEZ whose telephone number is (571)270-1490. The examiner can normally be reached on Monday - Friday, 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cheryl J. Tyler can be reached on (571)272-4834 or Frantz Jules can be reached on (571)272-6681. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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